Managing black bears in

Today, the black bear is a valued member of California's fauna. In comparison with many other states, California's bear population is closely monitored and managed.

Perhaps it was the pioneers' dislike and fear of grizzly bears that painted the black bear as a pest and generally undesirable inhabitant of the western United States well into the 20th century. California

By Doug Updike and Tim Burton

was no exception, while bears were classified as furbearers in 1917, there were no restrictions on how, when or how many bears could be killed until1948.

In 1948 bears were classified as game animals, seasons were established, a license was required to hunt and trap bears, and only two bears per year could be taken by an individual. However, there still were areas in California were bears could be hunted year round. In the northwestern counties of Humboldt and Del Norte, bear hunting was allowed year round from 1953 until 1961. Trapping for other than damage control was outlawed in 1961.

Knowing the number of bears that are killed as well as the sex composition of the kill is essential to managing bear hunting and populations. While hunting was regulated and a license required, there was no system that allowed the Department of Fish and Game (DFG) to determine how many bears were being taken or what the sex and age ratios were of bears killed by hunters. In 1957 hunters were required

California

to purchase bear tags and those who were successful returned the report card portion of the tag that provided information on locality and date of kill as well as the sex and age (adult or cub) of the bear that was taken. As the information from tags accumulated, the DFG began to form a better idea of the state bear resources as well as areas that were important to bears and bear hunters.

Along with better information on bears and bear hunting, rapid improvements in the DFG's ability to safely capture and handle bears for research were occurring. In the 1970s, DFG and agencies such as the National Park Service began bear research projects that provided a great deal of information about the effects of hunting on bear populations as well as how bears used their habitats and what populations were over large areas. For the first time, important life history information such as the age when females first have cubs was available. Information from these efforts along with data from the tags that were returned by hunters further informed the management of bears in California.

Regulation changes that resulted from our increased knowledge included reducing the bag limit from two bears to one in 1968, prohibiting the killing of cubs or females with cubs in 1972, and prohibiting the practice of training dogs to pursue bears other than during the regular bear season. That information also enabled DFG to identify areas in the state where the use and training of trailing hounds should be restricted.

DFG's increased efforts to gather information on the biology of bears as well as increasing concerns by

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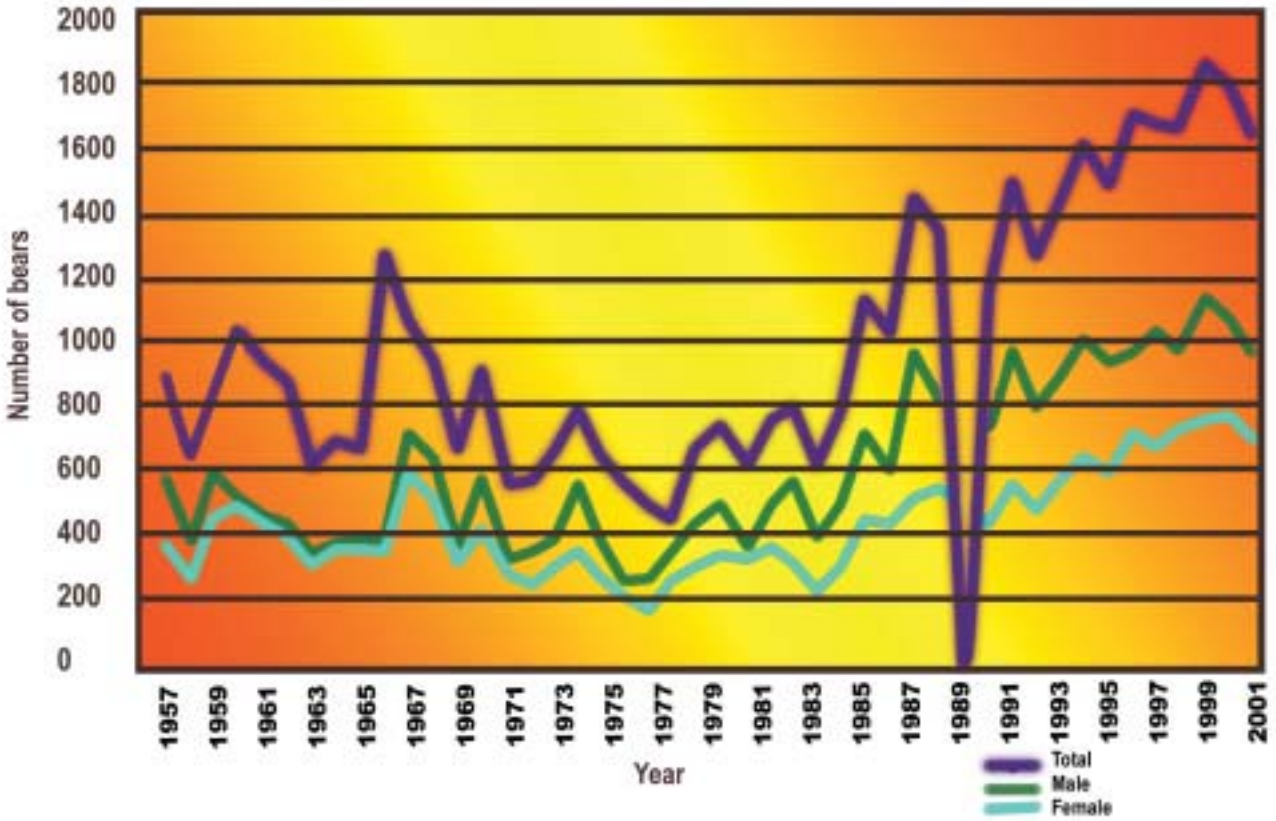
Clockwise from top left, bear recovers from immobilzing drug used during capture so biologist can collect data. Data includes measurements of foot pads. Weighing bear. A radio collar. Bear recovers from processing with collar on. Bear in tree has been snared.

Black Bear Harvest (1957 - 2001)



Percent Female Black Bears in the Harvest (1957-2001)

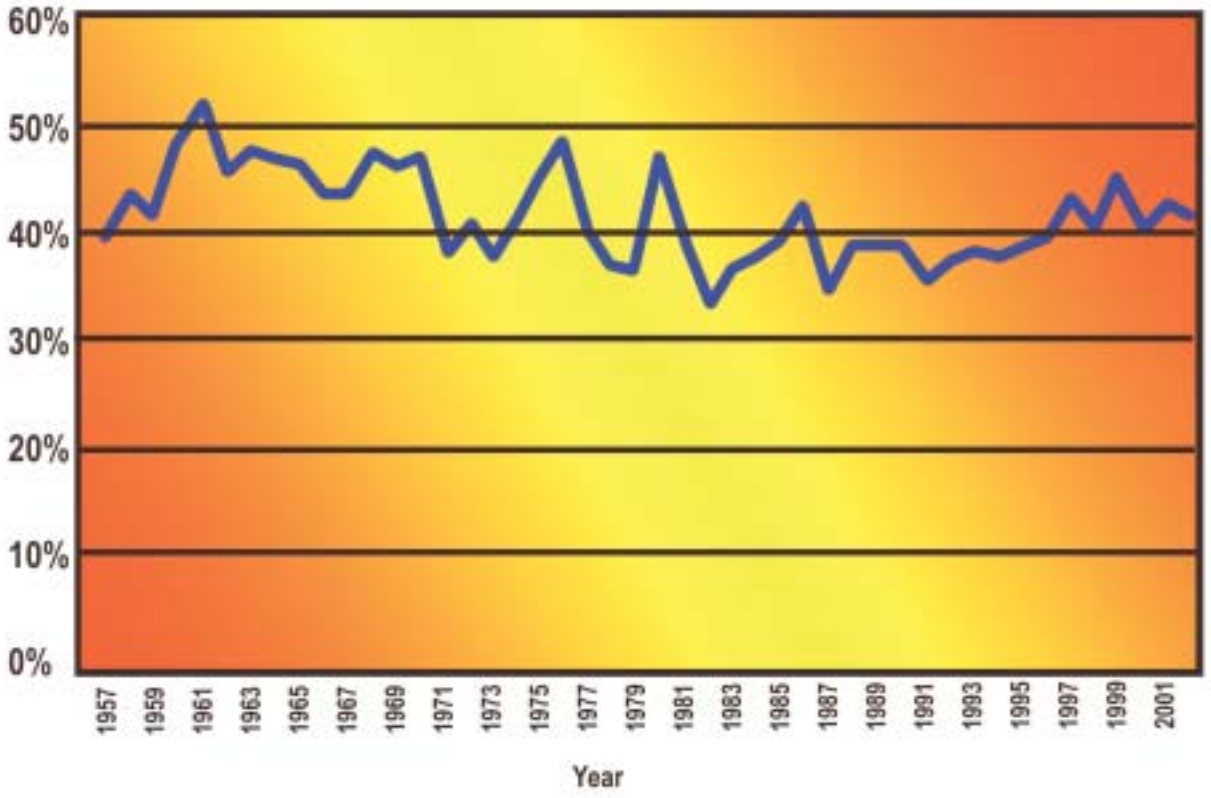


Photo © William Grenfell

Right, a cubby trap designed to direct a bear to a snare.

Middle, removing a bear from a culvert trap.

Bottom, a cub with tags and a color.

DFG photos by staff

the public contributed to the further evolution of DFG's bear management program. DFG felt more information could be obtained from kill data and so we now require the mandatory return of bear tags. Hunters are required to bring bears that have been killed to DFG for tag validation as well the removal of a premolar tooth from the bear. The tooth is used to determine the bear's age and thus develop more precise information about bears that are harvested and how to manage bears and hunting in California. DFG biologists use all of the data that is collected to monitor and assess the effects of hunting on the bear population. Annually, the data is compared to previous years to determine trends that would trigger adjustments to the hunting program.

By sampling and analyzing the age structure of the bear population, DFG can look at past mortality. The presence of bears at all ages in the population indicates that there have not been any catastrophic events which precluded production of cubs or the occurrence of major die-offs. Had these kind of events occurred, there would be a noticeable gap or absence of animals representing that age classification. Fewer animals representing the first and second age classes in the harvested animals is because killing cubs (bears less than 50 pounds) is illegal, and hunters tend to select larger animals. The distribution of ages in California's bear population shows the population is represented by all age classes and mortality rates are

Bear harvest statistics – male and female

	1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996		1997			
County	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Alpine	5	2	3	4	5	2	0	0	1	0	1	1	2	0	4	6	3	0	3	5	5	9	3	7		
Amador	2	0	2	0	2	0	0	0	5	1	0	0	1	0	0	2	0	0	1	1	1	3	2	0		
Butte	31	12	43	15	37	15	0	0	50	26	27	25	21	13	35	8	41	15	38	21	18	13	42	21		
Calaveras	2	1	12	3	1	0	0	0	6	7	11	3	2	1	11	1	7	2	7	4	16	9	11	15		
Colusa	1	0	0	0	1	1	0	0	1	2	1	0	1	2	0	0	1	0	1	0	1	0	3	2		
Del Norte	18	8	15	9	15	13	0	0	20	16	27	21	10	18	18	16	21	11	18	21	37	7	16	19		
El Dorado	15	4	45	15	19	10	0	0	18	12	31	7	21	12	33	16	18	9	41	7	14	8	32	12		
Fresno	12	10	26	19	21	8	0	0	41	13	31	16	33	20	28	11	41	24	46	14	50	24	51	34		
Glenn	6	12	12	8	10	4	0	0	10	6	11	8	4	4	15	6	15	5	3	6	17	6	8	3		
Humboldt	34	23	79	23	96	49	0	0	41	22	46	19	59	42	61	33	76	49	42	48	58	43	65	54		
Inyo	2	1	3	1	7	1	0	0	2	0	0	1	0	0	3	0	3	2	3	1	3	1	2	0		
Kern	4	8	12	8	13	3	0	0	19	9	13	7	18	6	5	5	20	5	22	4	29	12	21	11		
Lake	4	1	0	4	6	4	0	0	2	3	5	3	7	4	8	2	1	2	2	2	8	7	8	8		
Lassen	2	2	6	2	8	5	0	0	0	2	12	4	4	5	8	6	14	8	10	9	5	6	4	3		
Los Angeles	1	0	3	1	0	2	0	0	2	1	5	0	5	6	10	4	3	4	10	4	4	4	3	2		
Madera	10	11	24	8	16	10	0	0	11	4	21	16	12	8	22	13	17	17	23	15	28	19	36	31		
Mariposa	18	11	12	4	17	14	0	0	13	11	16	10	7	4	5	4	4	5	22	7	20	12	16	6		
Mendocino	31	19	59	33	22	25	0	0	26	20	67	36	40	29	37	49	51	50	47	41	49	47	45	41		
Merced	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0		
Modoc	0	0	0	1	0	0	0	0	1	0	1	2	5	1	1	0	2	1	1	0	3	2	0	0		
Mono	1	2	1	4	2	4	0	0	1	0	2	2	4	3	4	6	5	0	3	2	3	3	5	2		
Napa	0	0	1	0	1	0	0	0	2	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0		
Nevada	5	2	11	0	6	1	0	0	6	1	8	5	9	2	7	4	10	6	14	8	1	6	8	4		
Placer	16	23	24	13	16	10	0	0	19	8	19	14	17	3	33	11	18	13	19	14	16	10	32	18		
Plumas	26	17	48	24	54	30	0	0	39	20	56	36	37	20	33	29	49	38	58	40	39	38	59	39		
Riverside	2	0	2	2	0	0	0	0	2	0	0	0	1	1	0	0	2	0	3	1	1	2	3	3		
San Benito	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0		
San Bernardino	5	7	4	2	5	7	0	0	14	3	11	12	11	8	13	6	21	10	19	7	11	8	14	4		
San Joaquin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0		
Santa Barbara	3	1	1	5	3	2	0	0	1	1	2	2	3	1	6	2	5	3	8	0	16	3	18	5		
Shasta	73	55	87	47	120	58	0	0	95	75	116	65	107	59	78	55	126	98	115	76	123	96	86	62		
Sierra	14	4	25	10	16	8	0	0	18	6	17	9	21	8	10	13	18	16	13	7	10	6	24	8		
Siskiyou	88	53	148	71	108	70	0	0	69	38	105	58	67	56	143	59	105	69	116	67	113	83	91	65		
Sonoma	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0		
Stanislaus	0	1	1	2	0	0	0	0	1	1	2	1	0	0	1	2	1	1	0	1	0	0	0	2		
Tehama	33	29	57	31	49	23	0	0	27	17	53	24	30	20	38	23	66	23	36	20	32	39	49	27		
Trinity	85	72	87	60	89	37	0	0	91	71	112	70	129	52	96	74	125	66	97	86	146	114	100	83		
Tulare	24	16	56	34	75	27	0	0	59	36	77	38	59	30	56	47	71	35	48	46	42	42	62	45		
Tuolumne	12	13	46	19	26	15	0	0	22	13	33	10	13	13	44	22	23	10	46	27	40	28	62	22		
Ventura	3	5	1	2	3	4	0	0	6	2	6	4	7	1	6	2	1	4	7	6	16	13	14	8		
Yolo	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1		
Yuba	2	2	10	3	13	6	0	0	4	4	6	3	8	2	1	6	10	5	5	3	0	2	11	3		
Unknown	0	1	5	1	1	2	0	0	6	0	1	1	0	0	3	3	11	7	14	6	0	1	0	0		
Total	591	428	971	488	884	470	0	0	752	451	952	533	775	457	877	546	1007	613	961	629	979	727	1006	670		

for 1986 to 2001

	1998		1999		2000		2001	
County	M	F	M	F	M	F	M	F
Alpine	4	6	10	16	10	9	2	3
Amador	0	1	2	1	0	0	0	0
Butte	17	11	34	14	18	20	23	16
Calaveras	10	3	8	4	11	8	10	7
Colusa	5	1	2	0	0	0	1	1
Del Norte	28	23	25	28	24	8	11	7
El Dorado	26	18	16	13	41	19	36	25
Fresno	39	23	45	25	63	31	51	27
Glenn	15	7	19	8	21	12	11	7
Humboldt	67	75	96	67	80	50	52	58
Inyo	1	0	2	1	3	2	2	0
Kern	21	13	21	11	52	26	52	33
Lake	9	7	5	2	4	4	14	13
Lassen	16	6	16	14	13	6	3	10
Los Angeles	4	2	11	2	8	5	9	6
Madera	33	17	20	21	22	19	25	21
Mariposa	12	3	19	11	12	8	26	9
Mendocino	45	57	45	46	57	36	73	49
Merced	0	0	0	0	0	0	0	0
Modoc	0	0	4	2	3	3	2	1
Mono	3	3	4	0	7	3	6	4
Napa	0	0	0	0	0	0	0	0
Nevada	4	5	6	9	10	10	9	8
Placer	14	22	11	21	22	16	20	17
Plumas	64	32	42	29	28	18	46	36
Riverside	2	0	2	0	3	1	0	2
San Benito	0	0	0	0	0	0	0	0
San Bernardino	14	3	12	5	6	8	16	7
San Joaquin	0	0	0	0	0	0	0	0
Santa Barbara	12	8	12	6	11	3	10	6
Shasta	94	90	127	81	105	74	61	43
Sierra	5	7	21	12	12	19	15	19
Siskiyou	115	90	162	98	97	82	63	41
Sonoma	0	0	0	0	0	0	0	0
Stanislaus	3	2	3	1	4	2	1	0
Tehama	48	27	43	43	35	30	51	28
Trinity	103	83	147	95	104	85	116	82
Tulare	50	53	51	24	66	67	73	57
Tuolumne	36	24	30	16	70	32	45	21
Ventura	16	8	13	7	18	9	13	8
Yolo	0	0	1	0	0	0	0	0
Yuba	3	3	6	7	10	7	3	5
Unknown	2	1	1	1	1	2	2	2
Total	940	734	1094	741	1051	734	953	697

A culvert trap is prepared for a bear capture by a National Parks Service employee. DFG uses a variety of methods to capture bears for gathering scientific data. The method depends upon the terrain, access and situation.

DFG photos by staff

DFG biologist conducts an examination of a bear. Information includes weight, measurements, age, along with overall physical health.

Left, harvest statistics for each county in California. DFG gathers the information annually following the close of the hunting season.

Top, DFG biologists work quickly with a captured bear to gather important information.

Middle and bottom far left, biologists extract a tooth that can be analyzed to determine the bear's age.

Below right, blood samples are taken and later analyzed at DFG's and other laboratories.

Top far right, foot measurement. Bottom far right, DFG biologists work in teams to collect information and release the bear as quickly as possible.

All photos © William Grenfell except for blood sample image provide by DFG staff.

relatively consistent from one year to the next.

Currently, the hunting season is closed when there are 1,700 bears reported taken or the last Sunday in December, which ever comes first. In the recent years, the bear hunting season has ended when 1,500 bears were reported taken. This caused the season to end before the last Sunday in December in five of the last six years.

In 1975, the total harvest was reported, but the number of males and females in the harvest were not determined. In 1989, there was no bear hunting season, and in 1990 there was a general bear hunting season, but no archery season.

One important factor for monitoring the bear population in California is the sex ratio of the bear harvest. It is an important indicator of the health of the bear population. Male bears are killed at a higher rate than they occur in the population as a result of hunter selectivity, and because male bears have larger home ranges and a correspondingly higher probability of being encountered by hunters. So, sex ratios will be biased towards males until fewer males are available for harvest. In the period from 1957 through 1980, the majority of the time the number of females in the harvest exceeded 40 percent. During the 1980s and early 1990s the proportion of females in the harvest was generally lower than 40 percent. This reduction in the proportion of females is believed to be due to reduced mortality in the population because of changes in the regulations and other factors causing the bear population to increase in size. The increase in the proportion of female bears in recent years is believed to be due to a regulatory change in 1996 which opened the bear general season with the deer general season in A,B,C, and D deer hunting zones. Because deer hunters can use only one dog during the deer season, they are less selective for males because they don't have multiple opportunities to select a large bear. These opportunities are often afforded bear hunters using multiple dogs after the deer season has ended. Beginning in 2002, the general bear season will also open with the beginning of deer season in zones X-8 through X-12.

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